

**BINDER CONTENT OF HOT MIX ASPHALT  
BY THE  
EXTRACTION METHOD  
ITM 571**

**APPARATUS**

- [ ] Oven maintained at  $221 \pm 9^{\circ}\text{F}$
- [ ] Armored thermometer with a range of  $100^{\circ}\text{F}$  to  $450^{\circ}\text{F}$
- [ ] Wash bottle
- [ ] Stiff bristle brush, 1 in. in diameter
- [ ] Centrifuge extractor in accordance with AASHTO T 164
- [ ] Filter rings for centrifuge extractor
- [ ] Vacuum extractor
- [ ] Filter paper, medium grade, for vacuum extractor
- [ ] Vacuum pump
- [ ] No. 200 sieve

**PROCEDURE**

- [ ] Weight of sample as follows:

<u>Mixture Designation</u>	<u>Minimum Weight of Sample (g)</u>
4.75 mm	1000
9.5 mm	1500
12.5 mm	2000
19.0 mm, C19.0 mm	3000
25.0 mm, C25.0 mm	4000
37.5 mm	6000

Method A - Centrifuge Extractor

- [ ] Dried sample placed in tared extraction bowl and weight recorded at approximately 221°F
- [ ] Sample in bowl covered with trichloroethylene and allowed to soak until loose
- [ ] Centrifuge extractor assembled with a dry tared filter
- [ ] Centrifuge started slowly and the speed gradually increased to a maximum speed of 3600 rpm or until solvent ceases to flow
- [ ] Procedure repeated until extracted solvent is light straw color, but at least three times
- [ ] Filter dried at approximately 221°F and weighed
- [ ] Extracted aggregate dried at approximately 221°F and weighed
- [ ] Fines in extracted solvent collected in accordance with procedures in AASHTO T 164. If a high speed centrifuge is used, the extracted solvent poured through the centrifuge at least twice.
- [ ] Percent of asphalt/binder is calculated correctly to 0.1% as follows:

$$\text{Asphalt/Binder Content, \%} = \frac{W_1 - (W_2 + W_3)}{W_1} \times 100$$

where:

$W_1$  = weight of test sample, g

$W_2$  = weight of extracted aggregate, g

$W_3$  = weight of fines in extracted solvent, g

Method B - Vacuum Extractor

- [ ] 50-100 g of filtering aid is weighed into a 1000 ml flask
- [ ] Dried filter paper weight recorded at approximately 221°F
- [ ] 500 ml of biodegradable solvent added to filtering aid and poured onto filter
- [ ] Vacuum pump started and run until pad is dry. Collected solvent is poured onto filter
- [ ] Dried sample placed in tared bowl and weight recorded at approximately 221°F
- [ ] Sample in bowl covered with extraction solvent
- [ ] Sample stirred until completely separated and essentially clean of asphalt
- [ ] Initial rinse poured through a No. 200 sieve placed on the extractor or filter
- [ ] Approximately 500 ml poured onto filter after initial rinse has decanted through the filter
- [ ] Sample rinsed with solvent until aggregate is clean of binder
- [ ] Sides of extractor and sieve rinsed clean
- [ ] All solvent decanted through the filter and filter has dry appearance
- [ ] Filtering aid gently stirred
- [ ] Water poured through the sieve
- [ ] Extracted aggregate rinsed with water and water poured through sieve
- [ ] Extracted aggregate rinsed until water is clear
- [ ] Fines collected in sieve rinsed back into extracted aggregate
- [ ] Filter dried at approximately 221°F and weighed
- [ ] Extracted aggregate dried at approximately 221°F and weighed
- [ ] Fines in extracted solvent collected in accordance with procedures in AASHTO T 164
- [ ] Percent of asphalt/binder is calculated correctly to 0.1% as follows:

$$\text{Asphalt/Binder Content, \%} = \frac{W_1 - (W_2 + W_3)}{W_1} \times 100$$

where:

$W_1$  = weight of test sample, g

$W_2$  = weight of extracted aggregate, g

$W_3$  = weight of fines in extracted solvent and water rinse, g

Method C - No Extractor

- [ ] Dried sample placed in tared bowl and weight recorded at approximately 221°F
- [ ] Sample in bowl covered with extraction solvent
- [ ] Sample stirred until completely separated and essentially clean of binder
- [ ] Initial rinse poured through a No. 200 sieve placed on the container
- [ ] Sample rinsed with solvent until aggregate is clean of binder
- [ ] Container used to collect solvent replaced with another container only if water and solvent forms a gel
- [ ] Extracted aggregate rinsed with water and water poured through sieve
- [ ] Extracted aggregate rinsed until water is clear
- [ ] Fines collected in sieve rinsed back into extracted aggregate
- [ ] Extracted aggregate dried at approximately 221°F and weighed
- [ ] Fines in extracted solvent and water rinse collected in accordance with procedures in AASHTO T 164. If a high speed centrifuge is used, the extracted solvent and water rinse poured through the centrifuge at least twice. Centrifuge cup verified to assure that the cup was not overloaded. If overloaded, another clean cup was used and procedure repeated with all of extracted solvent until not overloaded
- [ ] Percent of asphalt/binder is calculated correctly to 0.1% as follows:

$$\text{Asphalt/Binder Content, \%} = \frac{W_1 - (W_2 + W_3)}{W_1} \times 100$$

where:

$W_1$  = weight of test sample, g

$W_2$  = weight of extracted aggregate, g

$W_3$  = weight of fines in extracted solvent and water rinse, g

Fines Correction Factor

- [ ] Fines correction factor is calculated correctly to the nearest first decimal place (0.0) as follows:

$$\text{Fines Correction Factor}(C) = \frac{W_3}{W_5}$$

where:

$W_3$  = weight of fines in extracted solvent and water rinse, g

$W_5$  = weight of extracted aggregate passing the No. 200 sieve, g

- [ ] Percent of asphalt/binder is calculated correctly to the nearest first decimal place (0.0) as follows:

$$\text{Asphalt/Binder Content, \%} = \frac{W_1 - (W_2 + (C \times W_5))}{W_1}$$

where:

$W_1$  = weight of test sample, g

$W_2$  = weight of extracted aggregate, g

$W_5$  = weight of extracted aggregate passing the No. 200 sieve, g

$C$  = fines correction factor

NA - Not Applicable

X - Requires Corrective Action

✓ - Satisfactory

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Acceptance Technician

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INDOT

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Date

Comments

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